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**STOPPING  
WATER POLLUTION  
AT ITS SOURCE**



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**PROTOCOL FOR CONDUCTING  
A  
STORM WATER CONTROL STUDY**

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**Environment  
Environnement**

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STORM WATER CONTROL STUDY**

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Ontario Ministry of the Environment

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## FOREWORD

This document constitutes a protocol for conducting a Storm Water Control Study in accordance with the requirements of the MISA Sector Effluent Limits Regulations issued under the Ontario Environmental Protection Act.

The protocol outlines:

- ♦ the role and responsibilities of the discharger,
- ♦ the exemption criteria that determine whether or not a study is required, and
- ♦ the requirements that must be followed in conducting a study
- ♦ developing a control program.

The major steps for conducting the SWCS are illustrated in Figure 1.

The requirement to conduct a Storm Water Control Study as prescribed by the MISA Sector Effluent Limits Regulations applies to all direct dischargers listed in schedule 1 of the Regulations.



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## I. INTRODUCTION

As part of the strategy to meet the MISA goal of "virtual elimination" of persistent toxic contaminants from all discharges into Ontario waterways, control of contaminants in storm water runoff from industrial sites is required. The goal of storm water control is to reduce contaminant loadings to the maximum extent practicable and to ensure that storm water discharges are not-acutely lethal.

For the purpose of this document, storm water is defined as rain water runoff, snow melt, surface runoff and natural drainage from a plant site. Storm water discharges associated with industrial activity include but are not limited to discharges from drainage areas, drainage ponds, material handling sites, and raw material storage sites. Storm water which flows into process effluent which is then subjected to treatment is not classified as storm water for the purposes of this protocol.

Most storm water drainage systems direct storm water and surface drainage towards natural receiving waters. While adequate for property protection and safety concerns, these practices could degrade the quality of receiving waters and result in reduction or loss of water uses where the storm water is contaminated.

Storm water discharges were monitored for all sectors, under the MISA Monitoring Regulations. In addition, information on site drainage was collected as part of an initial report submitted by each discharger. Through this work, the Ministry was able to obtain preliminary information on the potential loadings of contaminants to the environment.

The MISA Sector Effluent Limits Regulations under section 11 do not set limits for storm water dischargers but require instead that each direct discharger conduct a Storm Water Control Study (SWCS). Under the study, the direct discharger will:

- determine the quantity and quality of storm water discharges;
- identify all known sources of storm water contamination (if any);
- identify the need for controls based on the nature of the problem(s);
- evaluate prevention and control measures;
- develop a **storm water control program (SWCP)**; if controls are needed, which identifies preferred prevention and control measures.

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This document outlines the steps that a discharger must follow when conducting a SWCS, and applies to those dischargers listed in schedule 1 of the MISA Sector Effluent limits Regulation.

A discharger is relieved of the obligation to conduct a SWCS if the discharger meets the exemption criteria set out in Section III of this protocol.

Under the MISA Sector Effluent Limits Regulations, a discharger is not required to submit the results of a SWCS to the Ministry for approval. The discharger must, however, keep the SWCS information required by this protocol on file, and make the information available to the Ministry upon request.

Subsequently, a discharger may be required by the Ministry to implement all or part of a SWCP resulting from the study.

Notwithstanding the above, the Ministry urges all the affected dischargers to implement the resulting Storm water Control Programs on voluntary basis, as expeditiously as possible, as a contribution towards a cleaner environment.

Implementation of a SWCP may result in the construction of sewage works, which will require the discharger to make an application for approval under the Ontario Water Resources Act. This Act defines "sewage works" to include storm sewers and storm water control facilities.

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## II. ROLE OF THE DISCHARGER

Unless exempt, it is the responsibility of a discharger:

- ♦ To comply with the requirements of the MISA Sector Effluent Limits Regulation by carrying out a SWCS within the time frame shown in Figure 1.
- ♦ To ensure that all requirements outlined in this protocol document are followed.
- ♦ To prepare the information required by this protocol, keep it on file, and make the information available to the Ministry for review upon request.

It is recommended that a discharger contact the appropriate municipality, Conservation Authority, or office of the Ministry of Natural Resources to determine if a watershed management plan is in place and, if so, whether the plan should be considered during the development of a SWCS.

Where a discharger meets the exemption criteria set out in this protocol, and is thereby relieved of the obligation to conduct a SWCS, the discharger must inform the "Director" in writing within one year of the in-force date of the regulation.

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### III. EXEMPTION CRITERIA

For the purposes of determining exempt status, large complex plants may choose to divide their sites into exempt and non-exempt areas where it is possible to clearly differentiate the two.

A direct discharger is considered exempt from the requirement to conduct a SWCS provided that the following criteria are met:

- Storm water is, prior to discharge, directed to a sewage works, for which a Certificate of Approval has been issued by the Ministry under the Ontario Water Resources Act, for collection, transmission, treatment and disposal;
- Storm water discharges mix with site process effluent and are subsequently treated by facilities used for the treatment of process effluents;
- The physical characteristics of the operation do not warrant a study because the process areas are totally controlled with no potential for contaminated storm water, run-off or drainage water to reach the receiver; or,
- A study that meets the requirements of this protocol, has been completed within the last 5 years, and no changes have been made to the plant since the completion of the study.

A discharger that deems itself exempt from the requirement to conduct a SWCS, should so notify the Director in writing within one year after the MISA Sector effluent Limits Regulation comes into force and shall prepare a Storm Water Management Report (SWMR) containing the following information and make the information available to the Ministry upon request:

- A schematic showing plant layout and collection systems for storm water;
- A summary of all available monitoring data that compares the contaminants found in storm water with the contaminants found in process effluents;
- Documentation of measured or estimated storm water volumes relative to volumes of other plant discharges;
- A summary of site practices for the management and/or treatment of storm waters, run-off or drainage waters with accompanying monitoring data; and,
- Plans for corporate long-term monitoring and auditing of site management systems for storm waters.

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#### IV. STORM WATER CONTROL STUDY (SWCS) REQUIREMENTS

The content of SWCSs may vary with each plant site. As a minimum, to ensure that all areas of potential concern have been adequately covered, the SWMR shall contain the following requirements:

##### A. Background

1. Prepare a site map showing the outline of drainage areas served by each storm water outfall, process outfall, and once-through cooling water outfall.
2. An estimate the monthly average rainfall, the total area drained by each outfall, as well as the total area of impervious surfaces on the site, including paved areas and building roofs.
3. The frequency of storm water related surges or by-pass events.
4. The volume of storm water discharged during representative storm events, as well as during dry weather conditions. Document the storm water computer models and calculation procedures used.
5. Identify all known potential sources of storm water contamination and typical contaminants.
6. Describe significant materials that are currently, or have been in the past, treated, stored or disposed of in a manner which may have caused storm water contamination.
7. Describe existing control measures that are used to reduce contamination of storm water.
8. Describe existing treatment processes for storm water discharges including the ultimate disposal of any solid or liquid wastes other than by discharge. The description should include:
  - a. analyses of treated storm water quality, including a description of sampling schedules, and sampling and analytical procedures used,
  - b. the location and capacity of inputs, by-passes, treatment, retention, equalization, and recycling operations.

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9. Identify all outfalls discharging untreated storm water that contain process or non-contact water discharges. In the event that fluorometric dye tests are required, a description of the method used, and for dye testing, the date of testing, and the on-site drainage points that were directly observed during a test, should be recorded.
  10. Prepare representative quantitative monitoring data based on samples collected during representative storm events, for the same parameters as those listed in schedule 2 (for the discharger's plant) of the MISA Sector Effluent Limits Regulation for the sector. Two types of samples are required. The first is a "First flush grab sample" taken during the first 30 minutes of the storm event. The second type is a "flow-weighted composite" sample for the entire storm event. Typically six to eight flow proportional composite samples are required to collect representative data. Each type of sample is to be analyzed separately. In addition Quality Assurance/Quality Control (QA/QC) are required to be collected in accordance with section 9 of the MISA Sector Effluent Limits Regulation.

NOTE: Representative storm events are those events that are greater than 2.5 millimetre of rain and at least 72 hours from the last 2.5 millimetre of rain

Samples must be collected from storm water outlets characteristic of the different plant areas (ie. process, parking lots, storage, and loading and unloading of any raw material, intermediate products, finished products, byproduct or waste product) to define the contaminants found in storm water.

#### Storm Water Impact Information

1. Discharge loading information of storm water effluents compared to the loadings for process effluent streams, for the same parameters as those listed in schedule 2 (for the discharger's plant) of the MISA Sector Effluent Limits Regulation.
2. Information on the acute lethality testing of storm water effluent streams discharged from the plant site and the potential sources of the lethality focusing on those sources that are outside the control of the discharger.

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## Prevention and Control Information

1. An evaluation of prevention alternatives, that considers, as a minimum, the following control strategies to:
  - a. Intercept storm water in and around areas of storage, loading and unloading of any raw material, intermediate products, finished products, by-product or waste product;
  - b. Minimize the accumulation and/or deposition of debris;
  - c. control the discharge from roofs or other catchment areas;
  - d. Control of contamination through the separation of interconnected collection systems;
  - e. Incorporate reuse/recycling of storm water for industrial purposes;
  - f. Good housekeeping (i.e. spill cleanup), and employee training and education.
2. An evaluation of control alternatives, that and considers, as a minimum, the following measures:
  - a. Oil/grit separator;
  - b. Sedimentation facilities;
  - c. Storm water retention ponds that meet a minimum treatment level of sedimentation for a 24 hour retention period during the runoff produced by 25 millimetres of rainfall in a 6 hour period;
  - d. Biological treatment systems;
  - e. Screening;
  - f. Spill control;
  - g. Infiltration techniques (where applicable); and,
  - h. Decontamination of soils, waste materials, etc.

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### Storm water Control Program (SWCP) Information

A program that will control storm water discharges using preferred alternative prevention and control measures shall be developed as part of the SWCS. A description of the control program shall include the following elements:

1. Methods of achieving storm water control, including the effectiveness of alternative prevention and control measures, and the preferred measures;
2. Project scheduling and costs;
3. On-going storm water monitoring plans which should include results of monitoring of at least 2 representative storm events per year.

The discharger shall maintain records to document the control measures undertaken as well as the monitoring data that will help assess the effectiveness of these control measures.

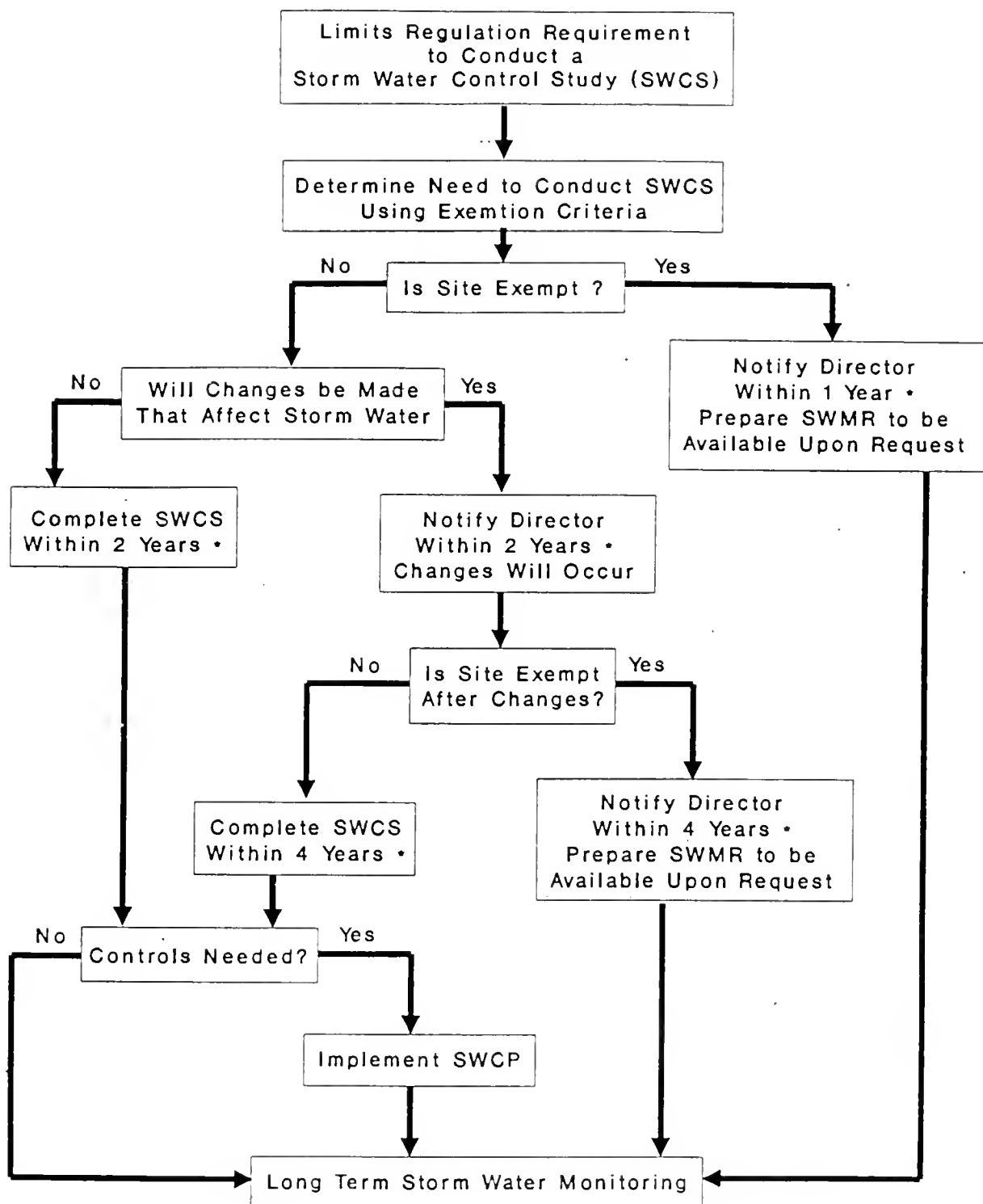
### Supplementary Information

Dischargers shall also include the following information in this SWCS:

1. Flow device description and calibration information;
2. QA/QC analysis of the storm water monitoring data; and,
3. A description of methods used to develop information for the SWCS i.e. storm water computer models, fluorometric dye studies.



Figure 1: Requirements for a Storm Water Control Study



• Time From Promulgation of Regulation





